



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,811	01/14/2004	Jeffrey P. Gambino	BUR920020121US1	1810
23389	7590	10/18/2005	EXAMINER	
SCULLY SCOTT MURPHY & PRESSER, PC				GURLEY, LYNNE ANN
400 GARDEN CITY PLAZA				
SUITE 300				
GARDEN CITY, NY 11530				2812
ART UNIT				
PAPER NUMBER				

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

APC

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/707,811	GAMBINO ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Lynne A. Gurley	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 03 August 2005.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-3,5-11 and 13-18 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 1-3 and 5-9 is/are allowed.  
 6) Claim(s) 10,11 and 13-18 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 27 September 2004 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
     1. Certified copies of the priority documents have been received.  
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.



LYNNE A. GURLEY

PRIMARY PATENT EXAMINER

TC 2800, AU 2812

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

This Office action is in response to the amendment filed 8/3/05.

Currently, claims 1-3, 5-11 and 13-18 are pending.

### *Drawings*

1. The drawings were received on 9/27/04. The Examiner has approved these drawings.

### *Specification*

1. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 10-11 and 13-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Ruelke et al. (US 6,893,956, dated 5/17/05, filed 3/31/03).

3. Ruelke shows the method as claimed in figures 1-2 and corresponding text as providing a lower metal wiring layer (104/204) having first metal lines 103/203 located within a lower low-k

dielectric 104/204, the first metal lines having an upper surface that is planar to an upper surface of the first metal wiring level; depositing a mechanically rigid dielectric layer atop the lower metal wiring level including the first metal lines positioned within the low-k dielectric, the rigid dielectric layer is a material selected from the group consisting of SiO<sub>2</sub>, a doped silicate glass, a carbon doped oxide and SiC (SiC105/250; column 7, lines 30-35, thickness in col. 8, lines 7-10); forming at least one via through the mechanically rigid dielectric layer to a portion of the first metal line (fig. 1e/ fig. 2i); and forming an upper metal wiring level having second metal lines positioned within a upper low-k dielectric (SiCOH; column 2, lines 50-61), the second metal lined being electrically connected to the first metal lined through the via, wherein the via comprises a metal having a coefficient of thermal expansion that substantially matches the mechanically rigid dielectric layer, the mechanically rigid layer separating the upper metal wiring level from the lower metal wiring level. Note that the figures are described for showing only a portion of the substrate and consequently only one interconnect, however it is inherent that the method is for fabricating a plurality of such interconnects (column 1, lines 1-40). The low-k dielectric layers may be low-k SiCOH, forms of SiN or low-k polymers (column 2, lines 50-67), since these layers are within Applicant's disclosed materials, it is considered inherent that they are within the claimed dielectric constant range.

Claims 10-11, 14-16 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Ueno (US 2005/0196959, dated 9/8/05, eff. Filing 4/25/03).

Ueno shows the method as claimed in figures 1-6 and corresponding text as providing a lower metal wiring layer 101/103 having first metal lines 103 located within a lower low-k

dielectric 101, the first metal lines having an upper surface that is planar to an upper surface of the first metal wiring level; depositing a mechanically rigid dielectric layer atop the lower metal wiring level including the first metal lines positioned within the low-k dielectric, the rigid dielectric layer is a material selected from the group consisting of SiO<sub>2</sub>, a doped silicate glass, a carbon doped oxide and (SiC [0075]); forming at least one via through the mechanically rigid dielectric layer to a portion of the first metal line; and forming an upper metal wiring level having second metal lines positioned within a upper low-k dielectric, the second metal lined being electrically connected to the first metal lined through the via, wherein the via comprises a metal having a coefficient of thermal expansion that substantially matches the mechanically rigid dielectric layer, the mechanically rigid layer separating the upper metal wiring level from the lower metal wiring level [00073]. Note that the figures are described for showing only a portion of the substrate and consequently only one interconnect, however it is inherent that the method is for fabricating a plurality of such interconnects (column 1, lines 1-40). The low-k dielectric layers may be low-k spin-on-glasses, and low-k polymers ([0072]), since these layers are within Applicant's disclosed materials, it is considered inherent.

***Response to Arguments***

4. Applicant's arguments with respect to claims 10-11 and 13-18 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2812

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne A. Gurley whose telephone number is 571-272-1670. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Lynne A. Gurley  
Primary Patent Examiner  
TC 2800, AU 2812

LAG  
October 17, 2005